MANAGEMENT PLAN FOR THE JORNADA RANGE RESERVE.

1924
June 21.

1. General Description.

A. Location of Area.

The Jornada Range Reserve is an area of typical semi-desert range lying in a basin adjacent to the Rio Grande Valley in Dona Ana County, New Mexico, about 50 miles north of the Mexican boundary.

The reserve was created by Executive order of May 3, 1922, at the request of the Department of Agriculture, with the idea of securing a complete range unit for conducting experiments and demonstrations in range management under conditions existing in southern New Mexico and similiar range country in adjoining states.

B. Status of Land.

Range Reserve is as follows:

Government land grazed	185,420 acres
State land grazed	16,260
Patented or private land	320
Total land within Reserve boundary	202,000

(See table for land status of each pasture)

The major portion of the area is a flat to slightly rolling plain varying in elevation from about 4,100 to 4700 feet, with a small mass of igneous mountains, the Dona Anas, at the southwest corner. The eastern portions of the reserve, about on-fourth of the total, includes the western slope of the San Andres mountains.

C. Soil.

On the plains and foothills, the soil shows an almost entire lack of humus, and there is no change in texture with depth except such as may be purely geological. The lime content is very high, and a highly limy layer or "caliche" is characteristic. The greatest amount of "caliche" is found under sandy or gravelled soils and the least under the heavier clay soils.

On the plains light textured soils, principally reddish sandy loams, loamy sands, and loose incoherent wind-blown soils predominate. On the rolling plain near the foot-hills of the mountians, areas of coarse gravelly soils are found, and in the center of the area are areas of compact tight clay or "adobe."

D. Timber.

Small areas of the woodland type are to be found on the north and northeast slopes of the various canyons in the San Andres mountains. The most common timber species found, are juniper and pinyon. The timber is of sufficient size to furnish posts and cordwood for the use of the reserve. It is estimated that at least five hundred fence posts and fifty cords of fuel wood can be cut each year which should be sufficient to cover needs of the reserve.

E. Reproduction of Timber species.

Reproduction of both woodland species is only fair and where it does occur is very scattering.

F. Climate.

The locality is one of the most arid in the Southwest. Records for 58 years at the State Agricultural College at State

College, New Mexico., about 15 miles southwest of the reserve, show an average annual precipitation of 8.58 inches with precipitation for individual years as high as 17 inches and as low as 3.50 inches. The main rainy season occurs during July, August, and September with an average of 4.50 inches these three months. Temperatures as high as 106 ° are common in summer, with almost continous high winds during the spring months, low humidity and consequently high evaporation.

The precipitation occurs during the main rainy season usually as local showers. There is a great variation in the amount of precipitation on different portions of the reserve in any year. This variation in precipitation has a direct influence on the grazing capacity of the range. In order to determine the variation and influence on grazing capacity, six rain-measuring stations were established on the reserve at distances of 7 to 13 miles apart.

Climate plays a very important part in the economics of the range business of the Southwest and must, therefore, be considered in any plan of management.

6. Forage and Forage Types.

Practically 80 percent of the forage on the mesa portion is furnished by perennial grasses, of which, the most important are; black grama(Bouteloua eriopoda), red three awn(Aristida longiseta), tobosa (Hilaria mutica), dropseed(Sporobolus cryptandrus) and (Sporobolus flexuosus), ring muhlenbergia(Muhlenbergia arenicola), burro grass(Scleropogon brevifolius), alkali sacaton (Sporobolus airoides). Some of the important browse species found on the reserve

are, mesquite(Prosopis glandulosa), black brush(Flourensia cernua), creosote brush(Covillea glutinosa), shadescale(Atriplex canescens), sagebrush(Artemisia filifolia),and Mormon tea(Ephedra torreyana).

There are a large number of both perennial and annual weeds, as well as various annual or "six weeks" grass species that occur during the rainy season and furnish some forage for the stock.

The forage in the mountain area is furnished by mixed perennial grasses and browse, of which the more important grasses are: blue grama(Boutaloua gracilis), black grama(Boutaloua eriopoda), hairy grama(Boutaloua hirsuta),sideoats grama(Boutaloua curtipendula), mountain timothy(Lycurus phleoides), and mountain needle grass(Aristida schiedeana). The more important browse species are: Apache plume(Fallugia paradoxa), mountain mahogany(Cercocarpus breviflores),and sage brush(Artemisia filifolia).

The vegetation is grouped into types because of the time of the year during which the forage in the various types is palatable to cattle and due to the growth habits of the main forage species. The grama-grass type, mixed grama,three-awn and dropseed grass type, snakeweed type and mesquite sandhill type constitute the yearlong or winter range and the swag, mixedtobosa,burro, and and salt grass types, and black brush -creosote bush type make up the summer range. The winter and summer range types have been divided up into pastures or grazing units. See table as to pasture and type acerages and type of forage.

H. Water.

Water previous to the time that the range was taken up by Mr. C.T.Turney the cooperator with the Department of Agriculture was poorly developed. There were a number of springs in the San

Andres mountains, and several intermittent lakes or flat depressions on the mesa. Later on, deep wells were put down so that now water is pumped by windmills and engines. Additional water is furnished by a pipe line extending from springs in the San Andres and by tanks which catch and store flood waters. Water development has progressed to such a point that there are very few range areas on the reserve that are five miles from water. See table for water facilities for each pasture.

I. Poisonous Plants.

There are two poisonous plants, namely, blue loco(Astragalus Bigelovii), and rattleweed loco(Astragalus allochrous) that are of any importance on the reserve. The blue or wooly loco occurs rather abundantly in wet years on the adobe flats northeast and east of Headquarters ranch and in the west end of pasture 13 near Brock tank. The rattleweed loco occurs very extensively in years of heavy precipitation in the sandy areas during the late winter and early spring.

Losses from poisonous plants on the reserve are extremely small. During years of good forage crops losses are nil.

The eradication of the two locos has been done on an experimental basis and results show that blue loco canbe eradicated by grubbing. The grubbing out of rattleweed loco was not successful due no doubt to the exceedingly large seed crops that it produces. The rattleweed was grubbed out before the seed pods formed but a large percent of the seed lies dormant in the ground and germinates when there is sufficient available soil moisture.

Since excellent results have been secured in grubbing out

the blue loco, the plan for the future should be grubb out not less than ten acres each year.

J. Range Destroying Rodents.

The importance of range destroying rodents as a factor in the reduction of the grazing capacity of a given range unit cannot be over-emphasized.

The eradication of prairie dogs by the Biological Survey was practically completed in 1917 . A small number of dogs were found in 1922 and poisoned.

The excellent results secured on the reserve in eradication of prairie dogs have been an incentive to the cattlemen of the adjacent ranges. During 1922 and the spring of 1923, the Biological Survey in cooperation with the cattlemen carried on extensive dog poisoning campaigns on the ranges adjacent to the Jornada.

The most important range destroying rodent problem now on the Jornada is the eradication of the kangeroo rat. The kangeroo rat infestation is very extension over the reserve and particularly the sandy soil areas. The heaviest infestation occurs in the sandhill pastures, aprticularly pastures 1,2 and 3.

In cooperation with the Biological Survey preliminary poisoning work of kangeroo rats has been carried on previous to 1924. Plans have been made and are being followed out at the present time to poison the rat on the grama grass areas. The approximate acreages by pastures to be poisoned and the percent of the pastures to be poisoned are to be found in the following table:

(Next sheet)

Pasture No.	Acreage to be poisoned	Percent to be poisoned
1	14720	19.7
2	33775	100.0
3	2410	100.0
5	2815	100.0
7	1450	100.0
8	1280	32.0
10	4805	100.0
13	5440	32.0
14	770	100.0
Total for Reserve	67465	45.1
Outside-1 mile strip	10880	

The future plan should be to complete the mesa portion of the Reserve when cooperative funds permit. The area to be poisoned each year will depend upon the amount of funds available.

The results of eradication of the kangaroo rat should be apparent in the increased carrying capacity of the range.

K. Predatory Animals.

The loss ofcalves by coyotes has been extremely low , some loss occuring during drought periods. Trapping has been resorted to to keep the coyotes from increasing too rapidly. This plan should be followed out each year.

L. Game Animals.

Some deer are to be found in the San Andres mountains. Deer show very little increase even though they are partially protected due to the inaccessibility of the country to hunters during the open hunting season.

Antelope are gradually on the decrease due chiefly to drought conditions. Seldom are young antelopes to be seen on the reserve or adjacent ranges.

The number of deer and antelpoe on the reserve is not a

factor to be considered in the carrying capacity of the whole reserve.

M. Previous Management.

The Jornada Range Reserve previous to 1911 had been used by small owners who had either been unsuccessful in sinking wells or had suffered heavy cattle losses from drought. Eventually their range rights were purchased Mr. C. T. Turney. Water facilities were bettered by the development of several wells and tanks but the area was handled much the same as the average open range prior to the creation of the reserve, May 3, 1912. Stock grazed any part of the range yearlong, no provision for drought was made, losses and calf crops were about the same as the open range.

During the severe drought of 1908-10, losses were excessive as on the open range. The result was the removal of the cattle from the area and in 1911 when the drought was over, only 600 head of cattle remained.

The need for changes in the management of both range and stock, with adjustment especially to meet the trying conditions during drought conditions, led to the establishment in 1912 of the Jornada Range Reserve for a study of the problems involved. Investigations started in 1915 by the Forest Service are still in progress.

The results secured in the period 1915-1919 are presented in bulletins 588, 1917 and 1031, 1922.

N. Salting.

There has been little done in the way of salting in accordance with improved methods. Particularly is this true in regard to salting away from water and this due chiefly to the atitude of the cooperator, which is in keeping with the general practise of the

range country surrounding the Jornada.

The general practise at the present time is to salt both in the winter and the summer at watering places and usually there has been an insufficient amount of salt available for the use of the stock using that particular range.

During the past two years the amount of salt that has been available at watering places on the reserve has been less than one pound per head per month. The amount should be increased to 1½ pounds per head per month or a total of 18 pounds for the year.

Since cattle require more salt during the main growing season and fall months, it is desirable to salt at the rate of 2 pounds per head during the period from July 1 to December 31 and for the period January 1 to June 30 at the rate of 1 pound per head per month.

To further improve the present practice it is recommended that all salt be placed atadistance of at least of1½ miles from watering places and in rather accessible locations for the purpose of getting to the slat grounds with a wagon.

As long as the cooperator continues to use the mountain pasture number 11 for horses it is doubtful if it would be desirable to insist on salting away from water in this pasture. Should cattle be placed in this pasture later on, salting should be carried on at the salting places as designated on the salting map.

The accompanying table and map show the plan of salting that is recommended for the Jornada Range Reserve "

C. Season of Use.

1. Winter or Yearlong Range.

a. Grama grass Type.

The grama grass type has been used either as yearlong or winter range. Black grama grass is the predominating grass in the type but red three-awn and dropseed grasses occur to some extent. There are areas where red three-awn and the dropseed grasses are more abundant and thereby form a mixed yearlong grass type.

b. Mesquite sandhill type.

The mesquite sandhill type has a low density of palatable vegetation. It occupies more area than other type on the plains area of the reserve. The best seasonal use of the type is secured in winter and spring.

2. Summer Range Types.

The most important forage plant in the summer range type is tobosa grass, since it is the most palatable and abundant of the grasses. The best utilization of the tobosa is secured in the main growing season. But if it is not grazed before it stops growth in the fall, it becomes dry and unpalatable to cattle and therefore is not grazed during the winter. Tobosa is not easily injured, because of its rapid and rankness of growth, underground method of revegetation and the compact soil that it occupies. Burro grass, a secondary grass is an early spring grass when there is available soil moisture. Salt or sacaton grass is utilized during the main growing season and has not any forage value after the frosts come.

F. Carrying Capacity.

Teble no._____ shows the carrying capacity for the reserve for a period of eight years beginning withe fiscal year 1916 and ending withe fiscal year 1923. The table shows that the average number of stock carried on the mesa portion during the 8-yr.period was approximately 2562 head of grown cattle and horses. Since the individual years included in this period have varied from extreme drought to good average years, it is thought that 2562 head is the practical number to base the future carrying capacity estimates upon.

Another method of determining the carrying capacity was a check reconnaissance of the original reconnaissance in the fall of 1923. From the extensive grazing reconnaissance data, it was determined that during the past eight years subsequent to the completion of the original reconnaissance that there had been a reduction of 68 percent in the forage acre estimate. The number of forage acres has been reduced from 37907 to approximately 12228. An analysis of the quadrat data also shows that there has been such a great reduction. Even in some instances the vegetative loss has been greater than 68 percent.

Since it is reasonable to assume that the original forage acre estimate was perhaps 30 to 35 percent too high, due to estimating palatability too high and the less accurate methods used at that time. It is believed that a forage acre estiamet on a basis of 68 percent of the original reconnaissance or 257.77 forage acres is more nearly correct. Then by using the forage acre requirement for of 8.4 as the basis for one cow yearlong, it is determined that the approximate

approximate maximum yearly rate of stocking should not exceed 3000 head of grown animals. It will be necessary to make a reduction of 15 percent or 450 head yearlong in order to allow for recuperation of the vegetative stand and to provide for critical periods. The number of grown animals to be grazed yearlong on this basis will be 2550 head which corresponds very closely to the average number of stock carried in the 8-yr. period.

The basis of the number of grown stuff to carry during a drought period was determined from the results as outlined in Bulletin 1031. The basis upon which the number of breeding cows was determined, was the number that should be carried during the drought. The number of stock to be carried during a drought period in pastures 3,5,7,8,9,10 and 12 has been increased 30 percent, assuming that it will be necessary to feed cottonseed or cottonseed cake. The total number of cows to be carried during a drought should not exceed 1500 head and in addition to this number 133 head of bulls and horses.

During good years it is contemplated that the feeding of concentrates will not be necessary. Sufficient reserve forage on a basis of 15 percent carrying capacity reduction should provide for emergency periods, particularly dry spring months which invariably prevail.

Forage acre estimates for pasture 11 are not available due to the fact that there has not been a grazing reconnaissance made. Since the pasture records are the only data from which an estimate of carrying capacity may be made, it must be taken for granted that the future carrying capacity can only be an estimate.

2. MANAGEMENT OF HERDS ON THE JORNADA RANGE RESERVE.

A. STATUS OF MANAGEMENT INVESTIGATIONS.

The investigations on the reserve since 1915 have shown that the ranges of southern New Mexico are essentially a cattle-breeding ground. The best permanent interests of the section will be served by developping the industry to produce calves and young steers and surplus cows. But the number and age of steers to be carried will depend upon the supply of range and forage and existing market conditions.

Heretofore the tendency has been to increase the breeding herd during good years to the limit of the grazing capacity. The result was that, in time of drought, the herd had to be sold at a sacrifice or excessive losses resulted. The alternative is to limit the breeding herd to a number that can be taken care of during periods of drought.

B. Status of Reserve Experimental Herds.

The plan as approved in 1915 has several specific objects. (1) to gradual improve the grade and consequently the value of the stock produced as a result of controlling the breeding herd in pastures; (2), the possibility of increasing the number of calves dropped per 100 cows as a result of controlling the breeding herd apart from other stock; (3), the reduction of losses from all causes by careful riding and attention; (4), the cost per 100 cows where this system is applied as compared with the cost per 100 cows in the larger pasture where the herd is so large that special attention cannot be given; (5), the use of concentrates to supplement the pasturage, and (6), to maintain the range and at the same time secure best possible utilization of the forage crop.

The least desirable cows have been culled out of the special herd each year and been replaced with good two-year old heifers. In 1918 no replacement was made because of drought conditions. In 1919 the herd was reselected and a total number of 287 head, 20 months old and up were placed in the herd. No replacements have been made since then, although old cows have been culled out of the herd each year.

Ever since the special herd was introduced, considerable difficulty has been experienced in keeping it in tact due to the lack of forage in the special herd pastures, especially during drought periods. When this occurred, it was necessary to move the special herd to the general herd pastures, thus allowing them to run, which rendered the special herd data much in error. Because of this, it has been recommended that subsequent to 1934 the special herd be discontinued at least until some time in the future when conditions will permit of again establishing a special herd, that can be carried and maintained separately at all times.

C. Future Management of the Herd.

1. Number of Cows.

Past experience on the Jornada Range Reserve has proven that the number of cows in the breeding herds must be limited to a maximum number of approximately 1700 head.

Since there is a surplus of T-hook cows, it is planned to cull out the oldest cows, stunted 2 and 3 year old heifers and a few shady colored cows that still remain, both on the Reserve and Turney's outside Range and establish one 1st. class herd on the Reserve from all of the T-hook cows. The culling out of the undesirable cows will grade up the herd to a very high standard which will include the offspring of the best cows from the old special herds.

In future years, the culling of breeding cows should be at the rate of ten percent for this herd and these culled cows sold when the yearly sale is made. Particularly old cows and individuals that do not measure up to the herd

standard should be culled out and sold.

The culled out cows will be replaced by unbred heifers that were selected the year previous.

2. Number and Kind of Bulls.

It is necessary that the bulls on the Reserve be replaced this fall with new bulls purchased from an outside source preferably nothern New Mexico or southern Colorado.

The type of bull purchased for the Reserve breeding herd should be pure-bred Hereford of good beef and breed characteristics. Large-boned hardy individuals are particularly desired.

The number of bulls per one hundred cows should not be less than 4, and 5 would be more proferable. An increased number of bulls would insure a larger and better calf crop. This is essentially necessary since pasture one is extremely large which renders breeding conditions practically the same as on the open range.

The maximum time which bulls should serve, should be limited to the time in which it would take to produce offspring of a breeding age from the bulls in service. Bulls should not be kept in service longer than three years or over three breeding seasons. The former practise has been to dispose of bulls for butcher purposes but it would be much more desirable to keep the bulls in good breeding condition and dispose of them for breeding purposes.

3. Pasture Management.

The breeding herd will be placed in pastures 1 & 13 during the summer, fall and early winter.

It has usually been necessary to remove the larger percent of the breeding cows from pasture one and thirteen about December first. Sufficient forage usually remains so that dry cows, two-year old heifers and a number of the stronger cows that calves have been weaned from can be left in the pasture through the winter and spring.

The remainder of the breeding cows will be placed in pasture 2 which has been held in reserve. Pasture two is primarily a winter and spring range because of the large acreage of black grama and mixed grasses. In order that pasture two may be held as a reserve for the general herd and have an opportunity to recuperate from the recent drought it will be necessary to restrict grazing to the minimum during the main growing season.

This is provided for in the Disbribution Table by closing the water at west well July to December 31, and carrying a very light stocking of approximately 115 head of cattle and horses. In Pastures 7, 8, 9, 10, 12, 14 grazing is deferred entirely during the growing season and until approximately January 1st. Note: In this connection. The dates specified on the Distribution Table are not meant to be hard and fast. In order to make the plan flexible, so that it will conform to varying conditions, it may be necessary or best to use a pasture as much as a month

or six weeks earlier or later than the time specified

4. Extra Care of the Breeding Herd.

a. Knowledge of Range and Condition of Cattle.

In addition to the general riding of the various pastures which is necessary at all times to keep informed as to the condition of both cattle and range, it will be necessary to ride pasture one at frequent intervals during the late fall and winter months. Thin cows, calvy cows and cows with calves can be readily picked up on these trips and placed in pasture 2.

b. Winter Feeding.

Such cows in pasture 2 that need feeding, will be placed in pasture 5 and fed cottonseed cake or cottonseed. Proper attention to poor cows will reduce losses materially and also maintain the cows in better condition for breeding when they are turned back into pasture one.

If it becomes necessary because of drought conditions, feeding operations can readily be carried on in pastures 2, 8, 10, 12, & 14, in addition to Pastures 3 & 7, when it will be necessary to feed Bulls. Thin and weak cows should be gathered and fed a light ration of cottonseed cake or cottonseed to maintain them in strong condition. It is essential that weak cows or in fact any class of stock be gathered before they become too weak and require a maximum of care. If gathered at the right time 1½ pounds of cottonseed cake per cow and 2 to 3 pounds per bull should be sufficient. If cottonseed is used, this amount should be increased 30 to 40%.

5. Control of the Breeding Season.

It is highly desirable to have better control of the breeding season because it invariably results in a uniform calf crop; uniform calves sell for a higher price and the cost of handling is considerably reduced because the branding and weaning operations can be planned and handled in a comparatively short time.

Since breeding stock in southern New Mexico is in the best condition during the main vegetative growing season, it is desirable that the breeding season conform to the main vegetative season as near as possible.

An important factor in increased calf crop is proper distribution of bulls during the breeding season. It will be necessary to ride the range constantly to keep the bulls well scattered at the different watering places during the breeding season. This plan contemplates a four months breeding season, July 1, to October 1. In good years this date should be one month or even two months earlier. This will bring the majority of the calves in April, May, June and July in good years one to two months earlier. The best practice will be to produce as early a calf as is possible and still be consistent with the condition of the vegetative cover and the growing season.

6. Branding and Vaccinating.

A general practise should be made of branding and vaccinating for blackleg twice during the year. Branding work has usually been done in June and September, depending upon climatic

conditions. It would be more desirable to brand once during late June or July and finish up the remanant at weaning time which usually occurs on or about December first. Such systematic handling of branding, vaccinating and weaning will not only facilitate the classification of the offspring and proper keeping of records but will also prevent the accumulation of any large number of unbranded calves in the pastures.

7. Weaning of Calves.

Calves six months and older will be weaned in the late fall or early winter at the time that the cows are gathered to be moved into pasture 8. Provision for the pasturing of weaned calves in Pastures 9 & 12 has been made providing they are not held too long. Even though the forage crop is sufficient to carry the weaned calves, it may be desirable to feed a small amount of cottonseed cake or cottonseed to keep them thrifty condition until sold. If calves are sold they will of course be best marketed at weaning time, which will do away with the necessity of feeding.

8. Records to be kept on the Herd.

Certain records are needed in order that the advantages of regulated use of range under fence and systematic management may be more definitely determined and are as follows:

a. Calf Crop.

An accurate calf crop record should be kept which will include the number of breeding cows, number of calves dropped during the calender year and the number of bulls. A record will be kept of the calves that die and the cause of loss and

far as it can be determined. The percentage calf crop should be figured on the basis of the number of calves marked plus the number dropped unmarked.

Factors determining the reasons for the increase or decrease in the calf crop each year should be carefully studied.

b. Improved Grade of Stock.

A general description of the general herd should be recorded at the time that the herd is worked in order to note improvement in grade, etc. A record should be kept of the number of cows culled from the herd at any time and the number of heifers placed with the herd for replacement. The class of stock produced and the value at different periods should be carefully noted. It will be desirable to secure weights of calves at selling time in order to compare the selling price with that of calves produced on the open Range.

c. Feeding Records.

An accurate record should be kept of feeding operations in order that the increased costs may be determined on the animal and herd basis.

d. Herd Losses.

Record should be made by calendar years of all stock losses, stating class of stock, specific reasons for losses and the total yearly loss in percentage and numbers. Such losses should be reported immediately on occurrence.

e. Prevention of Diseases.

It is necessary that any diseased animal be disposed of when found in order to avoid any general outbreak among the

herds.

The prevention of blackleg can be successfully carried out by systematic vaccination with germ free vaccine of all calves at branding time.

f. Costs.

The working plan of any operation should include an accurate cost record of all operations pertaining to its proper carrying out and should include the following items:

1. Fence maintenance and construction.
2. Handling of both cattle and range.
3. Water Development and maintenance.
4. Salting.
5. Winter Feeding Operations.
6. Prevention and control of Diseases on the Range.
7. Sales and record of transactions F.

Respectfully submitted,

June 21, 1924.

Grazing Examiner
In charge Jornada Range Reserve.

STATUS OF LAND

Jornada Range Reserve

By Pastures.

Pasture	State School Land	Patented Land. Approximately.	Government Land. Approximately.	Total area of pasture.
1	8180	90	66444	74714
2	3620	80	30075	33775
3	700	15	1695	2410
5	60	25	2730	2815
7	620	30	800	1450
8	40	5	3985	4030
9	140	0	644	784
10	640	10	4155	4805
11	credit 700 (Total5060)	15 (15)	51682 (47322)	52397 (52397)
12	480	0	6569	7049
13	1080	50	15871	17001
14	0	0	770	770
otal.	16260 (20620)	320 (320)	185420 (181060)	202000 (202000)

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SALTING SCHEDULE FOR THE PASTURES OF THE JORNADA RANGE RESERVE.

DROUGHT YEAR				GOOD YEAR			
July 1, to Dec. 31. 2-lbs per head per mo.		Jan. 1, to June 30, 1 lb. per head per mo.		July 1, to Dec. 31, 2 lbs per head per mo.		Jan. 1, to June 30, 1 lb. per head per mo	
Salt Ground	Salting period	Salt Ground	Salting Period	Salt Ground	Salting period	Salt Ground	Salting period
1 to 16	July Dec.	1 to 19	Jan. to June	1 to 15	July-Dec.	1 to 19	Jan.-June
1 and 7	" "	1 to 7	" "	1 and 7	" "	1 to 7	" "
1	Nov.-Dec.	1	Jan.-Feb.	1	Nov.-Dec.	1	Jan.-Feb.
2	July-Dec.	1	Jan.- June	2	July-Dec.	1	Jan.-June
-	-	1 & 2	" "	-	-	1 & 2	" "
-	-	1 & 2	" "	1 & 2	Nov. or D.	1 & 2	Jan.
1	Dec. or J.	-	-	1	Nov. or D.	1	"
-	-	1 & 2	Jan. to June	-	-	1 & 2	Jan. to June
1 & to 7	July-Dec.	1 to 7	" "	1 to 7	July-Dec.	1 to 7	" "
1 & 2	Dec.	1 & 2	Jan.	-	-	1 & 2	" "
1 to 6	July-Dec.	-	-	1 to 6	" "	1 to 6	" "
1	-	1	Jan. to June	-	-	1	" "

Note: This table to accompany salting map showing amount of salt required during each six months period in accordance with seasonal stocking on distribution ~~MAP~~ Table. Salting at the rate of eighteen pounds of salt per head per year, two pounds per head per month during the growing season and ~~And~~ July 1, to Dec. 31 and one pound per head per month Jan. 1, to June 30. Amount of salt to be put out in any one month figured from average number of stock the month previous according to the pasture records for any given pasture.

NUMBERS AND CLASSES OF STOCK TO BE CARRIED AS TIED INTO CARRYING CAPACITY AND ESTIMATED FORAGE CROP FOR A GIVEN YEAR.

CLASS OF STOCK.	1600	1800	2150	2400	2550	2800	3050
Breeding cows	1400	1500	1600	1700	1700	1700	1700
Bulls	70	75	80	85	85	85	85
Replacement heifers		150	160	170	170	170	170
Yearling steers or weaners	76	81	251	276	552	552	552
Steers twos and up.	---	---	---	125	---	250	500
Horses	55	55	55	55	55	55	55
Total yearlong	1601	1806	2146	2411	2562	2812	3062
Calf crop 65 percent.	910	975	1004	1105	1105	1105	1105
Yearling steers	910-1-month weaners.	975-1-month weaners.	502 6-Mo.	552 6- Mo.	552 1-Year.	552 1-Year	552 1-Year.
Steers twos and up.	---	---	----	500 3-Mo.	---	500 6-MO.	500 1- Year.

TABLE 4 CARRYING CAPACITY DATA FOR FISCAL YEARS- 1916-23(incl.)

Pasture	Fiscal Year 1916 Av.No. Stock	1917 Av.No.	1918 Av.No.	1919 Av.No.	1920 Av.No.	1921 Av.No.	1922 Av.No.	1923 Av.No.	Av.for 8yr. Period	Av.for 8yr.Period Acres per Head
1	1603.9	1550.0	875.4	1054.2	1167.7	1098.1	888.6	810.7	1131.1	66.0
2	1044.1	786.2	810.2	369.4	627.1	913.4	237.8	310.8	637.3	52.9
3	38.7	28.7	91.8	41.9	22.9	80.3	21.6	15.4	42.7	56.4
5	121.7	78.2	156.9	126.2	116.4	108.5	46.5	47.4	100.2	28.0
7	67.5	54.4	73.4	53.7	51.8	50.3	21.6	18.2	46.4	31.2
8	110.4	165.0	136.2	100.3	89.7	219.5	22.1	57.3	110.1	36.6
9	32.2	65.5	11.8	15.7	0.3	43.3	11.3	21.9	25.2	31.1
10	148.3	111.1	238.1	143.4	115.5	157.7	51.1	49.7	126.8	37.8
11	608.1	533.3	871.9	256.2	256.6	324.8	362.2	337.4	445.1	117.7
12	255.8	189.9	21.3	18.2	0.0	65.2	14.2	57.5	80.0	88.1
13	401.0	263.6	258.2	148.6	304.8	265.1	186.2	75.1	237.8	71.4
14	(Pasture enclosed in 1921)					30.1	64.8	14.9	13.7	56.2
Total	4431.7	3825.9	3545.2	2317.8	2753.8	3374.3	1928.0	1796.3	2996.5	67.4
Less P.11	*3823.6	3292.6	2673.3	2051.6	2496.2	3049.5	1565.8	1458.9	2551.4	58.6

Note: Pasture 2 contained 34,445 acres from 1916 to 1921 and 33775 acres since then due to pasture 14 being enclosed.

Note: Estimated carrying capacity for pasture 14 is 25 head yearlong.

2551
14
2527
25
2562 Average yearlong CC. for mesa portion of J.R.R. for period of 5 years.

Pasture 14 corrected to 25 head yearlong CC. 34 acres per head using 2562 head for total CC. Average for 8-yr. period mesa portion of Reserve is 58.4 acres per head.